Statement of Work
Inlet Model Test in Langley UPWT for Joint DARPA/U.S Air Force Hypersonic Research

1.0 Background

NASA is supporting DARPA in the area of hypersonics. The subject effort is a supersonic wind tunnel test of an inlet model in October-November 2014. The wind tunnel model will be sting-mounted with a flow-through inlet and have a remote control mass flow plug to provide metering of the inlet mass capture and back-pressuring of the inlet as well. The results of this wind tunnel test will provide a database of the inlet performance and operability on a design from the ATK/Raytheon contractor team under contract to DARPA. This inlet database will determine the viable flight envelope for the design, from an inlet perspective, and provide a dataset for assessing the capability of the state-of-the-art Computational Fluid Dynamics (CFD) codes for this type of application.

2.0 Scope of Work

NASA and the DARPA/U.S. Air Force shall utilize the selected supersonic wind tunnel to develop the inlet performance database for the ATK/Raytheon model configuration. To support the assessment of this ATK/Raytheon configuration, the data to develop the inlet performance and operability database is required from a continuous flow supersonic wind tunnel with a Mach number range of at least 2.5 – 4.5. A 42 inch long inlet model is being fabricated for wind tunnel testing. The selected test facility shall allow for the use of the existing model support hardware.

3.0 Technical Requirements

3.1 The selected test facility shall provide hardware requirements for testing in their wind tunnel. The contractor shall provide the wind tunnel facility and personnel to install the model hardware and perform the test matrix and shall provide all data reduction set- up, transmittals, data files and verification. The contractor shall perform check-loadings and angle-of-attack verification, wind off zeroes, and check calibrations for the linear potentiometer of the mass flow plug. Based on the test matrix, the contractor shall provide flow angularity evaluations. The contractor shall provide preliminary test data to ATK/Raytheon and NASA on-site engineers for review during the test. Final data shall be provided two (2) weeks after completion of the test matrix to ATK/Raytheon and NASA. The contractor shall disassemble the model and box the model for shipping upon completion of the test.

NASA plans to provide for support of the test program. This support shall include NASA personnel participating in technical reviews to support the test entry, provide test engineering support during the test conduct and shall provide a limited review of the test data.

This requirement covers a DARPA/U.S. Air Force inlet model test planned for the October-November 2014 timeframe. This

test will be used to support the follow-on development for DARPA/U.S. Air hypersonic systems in 2015.

3.2 The contractor shall:

3.2.1 Provide ATK/Raytheon personnel model/sting/high pressure air requirements for entry in the wind tunnel.

3.2.2 Provide personnel to review hardware interface checks conducted on the model support hardware (if required).

3.2.3 Provide all data set-up, transmittals, data files and verification.

3.2.4 Provide angle-of-attack verification, wind-off zeros, and high pressure tare procedures

3.2.5 Install inlet model hardware in the test section of the supersonic wind tunnel.

3.2.6 Perform wind tunnel tests during the October/November timeframe per provided test matrices. ATK/Raytheon inlet model test matrix attached.

3.2.7 Deliver preliminary test data during test for review by ATK/Raytheon and NASA on-site engineers during testing.

3.2.8 Deliver finalized test data with 2 weeks following test completion.

3.2.9 Removal and disassembly of model and box the model for shipping upon completion of test.

4.0 EXPORT CONTROL REQUIREMENTS

4.1 All technical data generated shall comply with all applicable export and ITAR requirements, NASA policies, and any established international agreements required by NASA policies.

5.0 MILESTONE SCHEDULE

Milestone (Inlet Model Test)	SOW Reference	Approx Deliverable Date
Provide model hardware requirements to ATK/Raytheon	3.2.1	09/12/14
Provide all data set-up, transmittals, data files and verification	3.2.3	10/10/14
Provide angle-of-attack verification, wind-off zeros, and pressure tare procedures	3.2.4	10/10/14
Delivery of model hardware to tunnel	3.2.5	10/15/14
Start model installation in supersonic WT	3.2.5	10/20/14
Perform test per test matrix	3.2.6	10/27/14 – 10/31/14
Deliver preliminary test data	3.2.7	10/27/14 – 10/31/14
Deliver final test data	3.2.8	11/03/14
Disassemble model and box for shipping	3.2.9	11/10/14